

DIAGNOSIS OF URINARY CALCULUS - AN AYURVEDIC PERSPECTIVE

Thameem Mohammed

Hemantha Kumar P.

Rao P. N.

Dept. of Shalya Tantra, S. D. M. College of Ayurveda and Hospital, Hassan, Karnataka, India

ABSTRACT

Urinary stone is one of the common diseases of the urinary tract. The classical symptom of urinary stone is pain with obstruction of urine. *Ayurveda* explains urinary stone under the heading of *Mutra Ashmari*. It classifies *Ashmari* on the basis of symptomatology of *Dosha* and the features of stone. The available explanations in authoritative texts of *Ayurveda* in diagnosis of calculus need more expertise. As the explanations in contemporary science are also based mainly on the symptoms and the characteristics of the calculus, comparative knowledge of it with *Ayurveda* may help the physician in proper diagnosis of the disease. Present article is built on a detailed study of the calculus and *Mutra Ashmari* along with an in-depth search in recent researches. Within the purview of *Ayurveda*, this article is aimed at making the diagnosis of *Ashmari* easier.

Keywords: *Mutrashmari*, urinary calculus, symptomatology

INTRODUCTION

Urinary calculus is a stone like body composed of urinary salts bound together by a colloid matrix of organic materials. The prevalence being high at any part of the world, males are affected more than females¹. Though causes for calculi formation are not fully understood, multiple factors are enlisted¹. In *Ayurveda*, the disease urinary calculus has been described in detail under the heading of *Ashmari*. *Sushruta*, "The Father of Surgery," has described its etiopathogenesis, symptomatology, medical and surgical management and prognosis in detail. Urinary stone has become a burning problem in the era of the modern medicine because of its high recurrence rate even after best available treatment. *Acharya Sushruta* explained the cause for the recurrence as not undergoing the *Shodhana*² (~purification treatment). An *Ayurvedic* explanation on

treatment of urinary stone is based mainly on the type of *Ashmari and Dosha*². But it may prove hard to diagnose it only on *doshic* symptoms as the urinary stones are obscured from external vision. Thus it needs an attempt to understand contemporary science, diagnostic tools to give a better approach for its management.

Conceptual Study: Detailed description regarding etiopathogenesis, classification, clinical features, prognosis and treatment are found in several authoritative texts of *Ayurveda*.

Pathogenesis of *Ashmari*: *Sushruta* explains the pathogenesis of *Ashmari* with the simile of water kept in earthen pot. He explains long stasis of urine in bladder as precursor of urinary calculi, explains with an example of sedimentation of mud at the bottom of an earthen pot, after prolonged storage of even clear water. And the process

is continued by the influence of *Vayu* and *Agni* in bladder in the presence of vitiated *kapha*³. According to *Charaka*, by the action of *Ruksha Guna* of *Vata* against *Shukra* or **Types of Ashmari**^{6,7,8}

Pitta or *Kapha* dries up *Mutra*, the *Ashmari* is formed in the *Basti*, as the bile hardens in the Gallbladder of the cow to form the ‘*Go-rochana*’^{4,5}.

Table 1: Showing the classification of *Ashmari* according to various authors

<i>Ashmari</i>	<i>Charaka</i>	<i>Sushruta</i>	<i>Vagbhata</i>
<i>Vataja Ashmari</i>	+	+	+
<i>Pittaja Ashmari</i>	+	+	+
<i>Kaphaja Ashmari</i>	+	+	+
<i>Shukraja Ashmari</i>	+	+	+

Signs and Symptoms^{6,7,8}

The clinical symptoms presented by a person who is suffering from *Vataja Ashmari* will have excruciating pain during micturation, pain at the umbilical region and passes *Vata*, *Mutra* and *Purisha* with high difficulty. The *Vataja Ashmari* is having the characteristics such as; it is blackish in *Color*, hard, rough with uneven surface and thorny like *Kadamba* flowers.

The person suffering from *Pittaja Ashmari* will present with different types of burning sensation, the *Ashmari* has characteristics such as, it is reddish and yellowish in color and surface is like kernel of marking nut or honey.

The person suffering from *Shlesh-maja Ashmari* will present with mild pain, *Ashmari* is having characteristics such as white in color, slimy in texture, large in size similar to hen’s egg or having color of *Madhuka* flower.

Urinary calculus

It is an organic matrix, mixture of muco-proteins and muco-polysaccharides. It consists of a nucleus around which concentric layers of urinary salts are deposited.

Types of urinary calculus^{9,10,11,12}

These stones are usually formed in acidic urine and usually consist of calcium oxalate, uric acid, urates, cystine, xanthine or calcium carbonate. Calcium Oxalate Calculus is a type of stone usually single and is extremely hard. It is dark in color due to staining with blood. This stone is popularly known as Mulberry stone. The peculiarities of this stone are - it is often impacted in the ureter, it causes bleeding due to its rough surface. There may be deposits of secondary phosphate on its surface leading to formation of mixed stone. Due to high calcium content it casts an exceptionally good shadow radiological view (radio-opaque). The rough surface may also be evident in x-ray.

Uric Acid and Urate Calculus: The majority contains urates and enough calcium oxalate to render such calculi radio-opaque. These stones usually occur in multiples and so are typically faceted and are of moderate hardness. Their color varies from yellow to dark brown. On section the stones display wavy concentric markings, with smooth surface. These stones usually occur in Acidic urine. These stones are yellow, soft and friable. But unfortunately if these do not contain some impurities like calcium

oxalate, so may not be visible on straight x-ray.

Cystine Calculus usually appears in patients with cystinuria, sometimes in young girls. Cystine is an amino acid rich in sulphur, Cystine calculi usually occurs in multiple. These calculi are soft and yellow or pink in color. When these are exposed outside, they gradually change to green. Such stones also occur in acidic urine. Xanthine calculi are extremely rare. These are smooth, round and brick red in color.

Phosphate Calculus: Are Majority of these stones composed of calcium phos-

Clinical Features^{9,10,11,12}

Table 2: Showing clinical feature of calculus, depending upon the site of the calculi

	Signs	Symptoms
Renal Calculus	Renal angle tenderness, renal point tenderness, Swelling-when there is hydronephrosis, Pyelonephritis, associated with renal calculus then swelling may be palpated in the flank, muscle rigidity- found only in cases with acute infection	Pain in flanks, blood mixed urine, nausea and vomiting, cloudy or odorous urine, frequent urination, strangury, fever and chills
Ureteric Calculus	Patient is usually in agony, tossing over bed, tenderness over part where calculus lies, skin is cold and clammy and there may be other signs of mild shock	Radiating, colicky, agonising pain, Nausea and vomiting, Blood mixed urine Urgency and frequency
Vescical Calculus	Giant calculi can be felt suprapubically, Rectal examination – Relaxed anal sphincter	Increased frequency, Pain and discomfort at the end of micturition, terminal haematuria, Dysuria, Acute retention of urine.
Urethral Calculus	–	Male-Obstructed flow, dribbling of urine, radiating pain in glans penis. Female-Increased frequency, dysuria, nocturia, Pyuria and in rare haematuria, dyspareunia.

Investigations¹²

Blood –Hemoglobin, Blood urea, Sr. Creatinine, Sr Calcium, Sr Uric acid
 Urine – color, pH, Sp gravity, Sugar
 Microscopic – RBC, Casts & Crystals, Epithelial & Pus cells;
 Ultrasonography; X- Ray KUB

phate, though a few are composed of ammonium magnesium phosphate, known as triple phosphate. Such calculus is usually smooth, soft and friable, with dirty white in color. Urine is often alkaline. Such stone enlarges rapidly and gradually fills up pelvis and renal calyces to take up the shape of stag horn calculus. This stone gives little symptoms due to its smooth surface. These stones are usually radio-opaque as these contain calcium. But it is also due to its large size rather than density that it is radio opaque.

DISCUSSION

By above review it is clear about various considerations of *Ashmari*. The symptoms mentioned under calcium oxalate stone mimic with *Vataja Ashmari* mentioned in authoritative books of *Ayurveda*. Uric acid stones, Urate Calculus appear yellowish

brown in color comparative to authoritative version of *Pittaja Ashmari*. Color changes of cystine stone initially yellow and green on exposure to external atmosphere again compares with basic color representation of *Pitta*. Phosphate stone impart white color, smooth surface, larger size, lesser pain com-

pared to other types of calculi, correlates with classical features of *Kapha*. Thus we can draw a conclusion of near relation between authoritative explanations of appearance of calculi in both treatises of *Ayurveda* as well as modern.

Table 3: Showing the similarity in symptoms

Symptoms	Type of <i>Ashmari</i>	Type of calculus
Severe pain, obstruction to flow of urine or intermittent flow of urine, stone- blackish in colour , hard, rough with uneven surface, and thorny like <i>Kadamba</i> flowers.	<i>Vataja Ashmari</i>	Oxalate lime calculus
Obstruction to flow of urine, burning type of pain with haematuria, stone is reddish, yellowish, black in <i>Color</i> and surface is like kernel of marking nut or honey <i>Colored</i> .	<i>Pittaja Ashmari</i>	Uric acid calculus, Urate calculus, Cystine calculus.
Obstruction to the urine flow with mild ache, it is white in <i>Color</i> , unctuous in texture, large in size similar to hen's egg or having <i>Color</i> of <i>Madhuka</i> flower.	<i>Kaphaja Ashmari</i>	Phosphate calculus

CONCLUSION

The explanations given by the authoritative texts of *Ayurveda* can be converted into standard norms for the diagnosis of *Ashmari* with the help of modern science. By comparing the external appearance of *Ashmari* with renal calculus we find that both are similar. By this comparison we may conclude that *Vataja Ashmari* is calcium Oxalate calculus, *Pittaja Ashmari* is uric acid, urate, cystine calculus, *Kaphaja Ashmari* is phosphatic calculus.

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CORRESPONDING AUTHOR

Dr. Mohammed Thameem

PG Scholar, Dept of Shalya Tantra

S. D. M. College of Ayurveda & Hospital
Hassan, Karnataka, India

Email: thameem.dr@gmail.com

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